

**ABSTRACT OF THE DISCLOSURE**

A method and system of routing variable-length packet data across a wave division multiplex (WDM) communications network having a plurality of data communications channels comprises inverse-multiplexing each data packet into a respective frame. Each frame includes a label block containing label information of the frame, and two or more respective payload blocks having a predetermined length. The label block contains encoded routing information, a start time, and, possibly an end time, and is transmitted over a label channel of the communications network. The start time preferably indicates a delay between launching a first bit of the label clock and the first bit of the payload blocks. The end time may be a bit count indicative of the location of the last bit of the data packet within the frame. The data packet is divided into a plurality of data segments, each of which is transported across the network within a respective payload block. Each payload block is transmitted over a respective separate data channel of the communications network. Routing control of the frame may be handled using the multi-protocol label switch (MPLS) protocol.